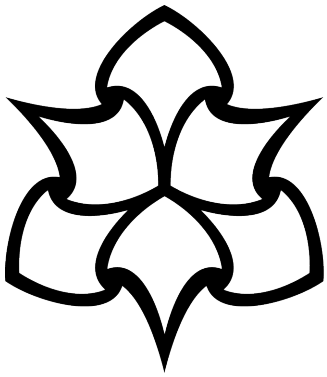

Organisational factors influencing non-pharmacological management of type 2 diabetes mellitus (T2DM) in public hospitals across Lagos, Nigeria: A qualitative study of nurses' perspectives

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ARTICLE INFO

Article history:
Received 18 November 2019
Received in revised form
24 March 2020
Accepted 24 June 2020
Available online 29 June 2020

Keywords:
Organisational factors
Public hospital
Type 2 Diabetes Mellitus
Management
Nigeria

ABSTRACT

Background: The prevalence and incidence of Type 2 Diabetes mellitus (T2DM) are significantly increasing in Nigeria. Effective management of the condition, in clinical settings, can be achieved with a minimal financial cost, but this is often overlooked. It is crucial to understand organisational factors influencing non-pharmacological management of T2DM in Nigerian public hospitals for effective management of patients diagnosed with the condition.
Aim: To examine healthcare delivery services influencing patient management and seek approaches to heighten optimisation of patient health outcomes.
Methods: Adopting a qualitative case study design, we used the Constant Comparative Method and semi-structured questions to interview17 nurses in public hospitals across Lagos. Using the five stages of the Framework Analysis process, the transcribed interviews were thematically analysed.
Results: Nurses suggested that a complex, multifaceted system constituted organisational factors influencing T2DM management in public hospitals across Lagos, Nigeria. Specific factors identified were levels of available information and knowledge, relationship, policy and decision-making management. These factors were, in turn, linked to political, infrastructural, health professional and the environments within which patients were given health services.
Conclusions: The study revealed a significant gap in the organisation of care for individuals diagnosed with T2DM in public hospitals across Lagos. Timely and affordable strategies have been highlighted to secure effective care delivery to patients.

Operational definition: AFR, Africa Region; BMI, Body Mass Index. A value derived from the mass and height of an individual. It is defined as the body mass divided by the square of the body height. Universally, it is expressed in units of kg/m2; IDF, International Diabetes Federation; NCDs, Non-Communicable Diseases. Non-transmissible directly from one person to another; WHO, The World Health Organisation. A specialized agency of the United Nations concerned with international public health, founded on 7 April 1948, and its headquarters is in Geneva, Switzerland; Type 2 Diabetes mellitus, A type of Diabetes mellitus (DM) that can potentially be reversed and certainly managed with the right treatment and care

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https://doi.org/10.1016/j.diabres.2020.108288

1. Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder characterised by chronic hyperglycaemia that results from disturbances of carbohydrates, fat and protein metabolism due to defects in insulin secretion, insulin action, or both [48,49].

This research focuses on non-pharmacological management of a type of DM, Type 2 Diabetes mellitus (T2DM). T2DM is often preventable, yet the past decade, has witnessed an increasing prevalence of T2DM and increasing management challenges [49]. Ineffective management of T2DM results in health-limiting and life-threatening complications that are detrimental to both holistic quality of life and capacity for work of individuals diagnosed with the condition.

There are various approaches to managing individuals diagnosed with T2DM. The approaches can be non-pharmacological, pharmacological and surgical. Despite the availability of multiple approaches to patient care, well-structured non-pharmacological approaches are often considered and recommended as the first option of care because they are efficacious, affordable and readily available [29]. These are lifestyle Interventions such as regular and aerobic exercises for weight-loss interventions. Meanwhile, regardless of the type of approaches adopted, patient empowerment is an essential element to optimal patient care [49]. There is a significant body of evidence that health settings often lack adequate policies and supportive environments for early diagnosis of T2DM. Most importantly, people with relatively limited incomes [49].

In Nigeria, the precise number of people diagnosed with T2DM is unknown. However, estimated epidemiological figures had presented Nigeria as one of the African countries with the highest prevalence of T2DM [30]. Adeloye et al. [4] conducted a systematic review and *meta*-analysis by estimating nation-wide and zonal prevalence, hospitalisation and mortality rates of T2DM between 1999 and 2015 in Nigeria. The age-adjusted prevalence rates of T2DM in Nigeria among persons aged 20–79 years increased from 2.0% (95% CI 1.9% to 2.1%) in 1990 to 5.7% (95% CI 5.5% to 5.8%) in 2015, accounting for an increase of over 874 000 and 4.7 million cases between 1999 and 2015.

Previous studies have investigated the causes of the high prevalence of T2DM in Nigeria and attributed it to rapid urbanisation [8]. Also, environmental factors such as people seating and driving for long times in high traffic situations have contributed to obesity and the problematic management of overweight people [42] as well as westernisation factors [26]. These factors were earlier described as the 'obesogenic environment' in modern societies [46]. Modern societies create an abundant supply of unhealthy foods, changes in food preparation and create facilities that increase people's chances of engaging in sedentary activities and lifestyle. These factors fuel obesity and even make the management of overweight people more difficult to achieve [1].

A recent systematic review conducted by Bosun-Arije et al. [13] showed that previous studies that explored factors influencing T2DM management across public hospitals in Nigeria were one-directional. Instead of investigating holistic factors influencing effective management of patients with T2DM in Nigeria, a significant number of previous studies, unfairly and unjustifiably blamed individuals diagnosed with T2DM, for being non-adherent and non-compliant with management regimen [52]. Little effort was made to explore real-world, clinical operations influencing patient management.

2. Methodology

This case-study research aimed to gain an in-depth qualitative perspective of the views of nurses on organisational factors influencing the delivery of effective care to patients diagnosed with T2DM in public hospitals across Lagos, Nigeria. To actualise the aim, a qualitative case study design was adopted to systematically explore clinical practices that influence T2DM management in the context of public hospitals across Lagos, Nigeria. Case study design facilitated rigorous, logical and transparent data analysis processes required to secure the credibility of this research findings.

The geographical parameters of this study encompassed five Lagos state secondary health facilities and one tertiary hospital located in Lagos state (see Table 1 for the selected hospitals, Fig. 1 for hospital locations and Table 2 for participants' demographics). Activities of all general hospitals are governed by the Health Service Commission (HSC). The HSC has statutory responsibilities for staff recruitment, deployment, promotion, discipline, and research. At the same time, the Lagos State Ministry of Health governs the overall activities of both the HSC and the state tertiary health institution [36]. To obtain in-depth and robust data, we purposively sampled Lagos state given that the state is one of the biggest and diverse states in Nigeria. As put by Sampson [53], different ethnicity, socio-economic and religious groups abound in Lagos.

Recruitment was from DM day units, medical ward, surgical ward, and outpatient department from six public hospitals across Lagos. Using a purposive sampling strategy, nurses from these units were approached after research ethical clearance and approval were obtained from the research governance department and institutional ethics committee in Lagos and the University of Sunderland Ethics Committee.

Holistic case-T2DM management was investigated. The holistic case has two sub-cases, organisational factors influencing T2DM management and nurses' views of the factors influencing the management of the condition within a bounded system. The bounded system in this research was

Table 1 – Characteristics (region and setting) of the six selected public hospitals across Lagos.

OWNERSHIP	REGION	SETTING
State general hospital	Island	Urban
State general hospital	Island	Rural
State general hospital	Island	Rural
State general hospital	Mainland	Suburban
State general hospital	Mainland	Urban
State tertiary hospital	Mainland	Urban

Fig. 1 – An overview of the research sites.

Table 2 – Demographics of the participants and their relationships with the hospitals.

Gender	15	female				
	2	male				
Location.		10	Urban			
		6	rural			
		1	suburban			
Education.			10	Diploma.		
			7	Degree.		
Professional qualification.				7	Nursing Office/Sister.	
				4	Principal Nursing Officer/Matron.	
				4	Assistant Chief Nursing Officer/ Chief Nursing Officer.	
				2	Apex.	
Ward.					5	Medical.
					5	Surgical.
					7	DM units.
Opted out.	1					
Total	17					

operationally defined as the government hospitals in rural, suburban and urban regions in Lagos, Nigeria.

3. Data collection method

For data collection, we used the Constant Comparison method and adopted three methods of data collection; in-depth semi-structured interviews, research notes and research journals. Seventeen nurses of various levels of hierarchy were interviewed face-to-face using semi-structured interview questions. At the point of sufficiency, interviews were concluded. This occurred at a point when no new themes, in light of the research objectives was emerging from the participants. This happened after 17 interviews had been conducted. Each interview session lasted 39–60 min. Interviews were audiotaped and transcribed verbatim. The data collection period lasted six weeks.

Research questions centred on three specific areas. First, the organisational factors influenced T2DM management in public clinical hospitals in Lagos. Second, how the factors

impact on patient health. Finally, approaches that could inform effective T2DM management with minimal financial implications.

4. Data analysis method

Both manual and computer-aided techniques (NVivo 11) were adopted and integrated for a rigorous and systematic and transparent data analysis. The Framework Method, developed by [43], was espoused for a systematic, transparent and thorough analysis of the transcribed data. The Framework Method entails five stages; familiarisation, identifying a thematic framework, indexing, charting, and mapping and interpretation. The Framework Method enabled the researcher to focus on six specific areas during data analysis. The areas are; usage of health facilities by patients, health services delivered to the patients, variations in service delivery and organisation of care for patients diagnosed with T2DM as well as available resources and experiences of the nurses in the light of clinical operations influencing T2DM management in the selected public hospitals across Lagos.

5. Process of thematic analysis

158 initial codes emerged from the words of the 17 participants. Considering the similarities and differences that existed among the 158 codes, codes were further amalgamated to form five initial themes. It was during the first three stages of analysis- familiarisation, identifying a thematic framework and indexing stages that the first five themes were developed.

However, given the significant similarities among the five initial themes, the initial five themes (retaining their elements) were further regrouped into three main themes; The Organisational Element, The Patient Outcome, and Optimising the Care Opportunity. The regrouping of the five initial themes to three main themes was a transparent, systematic and logical process that clearly showed the connection between the research outcome and research aims. To bring about the three main themes, the researchers rigorously and logically revisited the datasets that emerged from the participants and consulted related literature to affirm the significance of the themes to the research aims and objectives and most importantly that the three themes tangibly represent the information obtained from the participants.

It, therefore, translates that the three main themes that emerged from this research are aggregates of the raw information that emerged from the participants (the emic perspective) and the aggregates obtained through logical reasoning and after consulting with related literature (the etic perspective). This logical process is described as a mix of emic and etic knowledge, which are key components of qualitative methodology [16,17].

6. Findings

The purpose of this research was to investigate and analyse organisational factors influencing T2DM management in public hospitals across Lagos, Nigeria. This research also investigated the impact of the identified organisational factors on patients' outcomes as well as provided insight into approaches to optimise T2DM management.

This research considered the relevance of nurses as health professionals who spend a considerable amount of time with patients and work as a part of the multidisciplinary team, involved in the management of patients diagnosed with T2DM. Participants of this research comprised of 17 nurses working across urban, suburban and rural regions across Lagos state, Nigeria (see Table 2). Also, see Table 3 for an explicit description of the five initial themes.

Table 3 – Tabular description of the five initial themes.

Initial themes	Description
'Information and Knowledge management	Considered and linked to what, to whom and how information is disseminated among health professionals and its relevance to the management of patients with T2DM. Additionally, the conditions that are connected to the required knowledge useful for the management of T2DM by the health professional, the patients, relations and their community. This is a two in one theme but presented and described as one for coherence purpose.
'Policy and decision management.'	Policies and decisions that the nurses consider as doubly influential (both bad and good) on both the health professionals and the patients for the effective management of T2DM.
'Relationship management.'	This entails what the nurses described as the interactions that exist among different entities in the clinical environment: Nurse-nurse, nurse-doctor, nurses-patient, nurse-social worker, patient-patient, clinical setting-community, and patient-patients' relations and the need to recognise the relevance of these entities.
'The Patients' Reactions'	These detail the response of patients to organisational-related issues around decision making on glucose check, use of language, appointments, clinic arrangement, screening for a complication, and follow up care and paying for treatments.
'The Way Out'	These are what the nurses describe as ways by which the public clinical settings can enhance positive health outcomes for the management of individuals with T2DM.

Given the research aims and objectives, a critical process of systematic and logical reasoning of the Framework analysis method was adopted to generate five initial themes (see Table 3). The five initial themes were further developed into three main themes; the Organisational Element, the Patient Outcome and Optimising the Care Opportunity.

7. Main theme 1: The organisational element

Three of the initial five themes; 'Information and 'Knowledge management', 'Policy and decision management' and 'Relationship management' constituted the Organisational Element. The nurses recounted that knowledge and information was a crucial organisational element influencing patient management. Knowledge and information management were described to be underpinned by effective communication. Effective communication is an area explained to be paramount to what information and knowledge, in the light of T2DM, clinicians and nurses give to patients. As well as how it is given, who gives it, when it is given and how they translate into real-world settings.

Additionally, relationship management, as well as policy and decision management, constitute the Organisational Element. The nurses described relationship management as the interactions that exist among different entities in the clinical environment: Nurse-Nurse, nurse doctor, nurses-patient, nurse-social worker, patient-patient, clinical setting-community, and patient-patients' relations and the need to recognise the relevance of these entities in collaborative management of patients. The nurses recounted decision-making management as encompassing activities of health professionals and a wider number of stakeholders that influence the healthcare delivery system. A well-defined and feasible decision is crucial to collaborative working in the light of T2DM management. Below are words of different participants emphasising organisational factors influencing patient management. The first extract centers on the lack of information and knowledge regarding T2DM in the clinical setting. The second extract focuses on issues around relationship management and the third extract highlights policy and decision management in the clinical settings.

7.1. LRS01

''We need information, good information to the patients, both at the outpatient department... starting from the outpatient department before we start to give our total active management.'

7.2. LRS02

"Regarding decision making? They (the doctors) do whatever they want to do; you know? (Opening eyes wide) they are the owners of the hospital."

7.3. LSR08

"We have some glucometers that we have problems with especially the ones they are sending from abroad// immediately they exhausted the strips, for the patient to get another one, it is not always easy."

7.4. Main theme 2: The patient outcome

Positive patient outcome is achievable with effective T2DM management. As elicited from the participants of this research, health professionals can provide a sound support system for optimisation of patient health outcomes. The support system entails promoting patient self-support, pharmacological support, and non-pharmacological support as well and follow-up and annual monitoring support for the patients.

The second aim of this research was to analyse how the identified factors organisational factors influence patient outcomes. The nurses who participated in this research

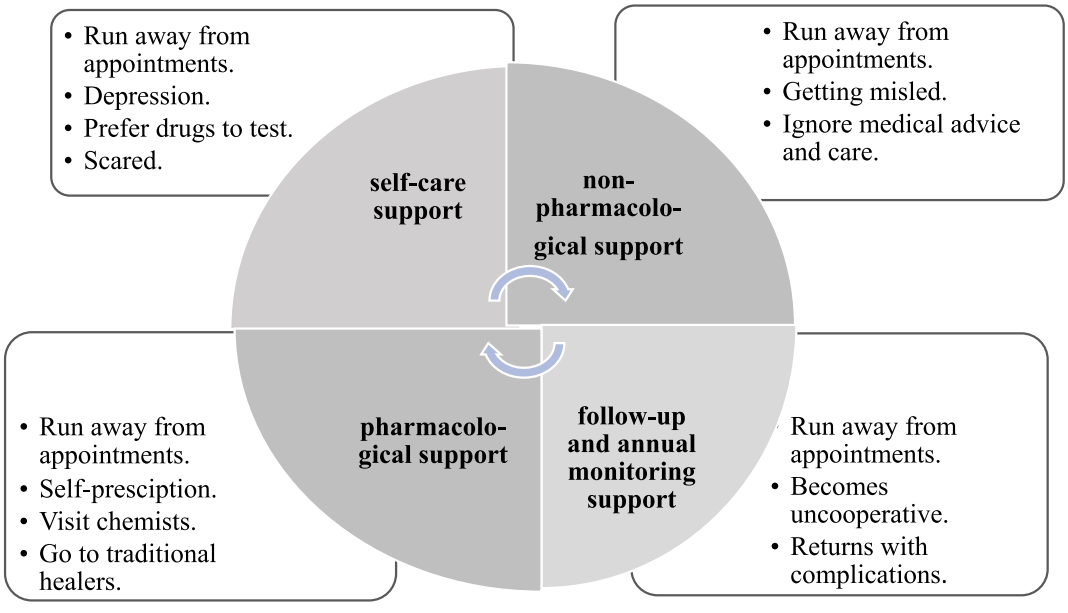

Fig. 2 – Impact of system failure on patient outcome in Lagos, Nigeria.

described how organisational element such as Out of Pocket Payment (OOP) led to the failure of the support system and the flexible billing method promoted patient management. Nurses recounted various components of a support system that can favour the optimisation of patient care (see Fig. 2). When the participants were asked about how a failed organisational support system could influence patient outcomes, their responses made evident how most patients stopped attending clinic appointments and sought alternative care elsewhere and this often led to a detrimental patient health outcome.

7.5. LSR015

"Patients run away from their clinics, return to clinics with complications, increased fear and anxiety, patient ignores test and prefers taking their drugs only, and when they develop depression, they go to chemists.".

7.6. *Main theme 3: Optimising the care opportunity*

The final aim of this research was to develop a strategy that could inform the management of T2DM in healthcare settings in Nigeria. The outcome of this research has resulted in the development of an integrated model for T2DM management in Nigeria. This model emerged from the approaches the nurses perceived to provide low-or-no-cost and successful outcomes to T2DM management in Nigeria (see Fig. 3). The approaches offered by the nurses were based on their real-life situations. These include consideration for staff recruitment, community mobilisation, use of flyers to educate patients, training DM specialists, initiating DM Registry as well as using humour when educating patients, develop guidelines and consider the use of technology and most importantly to provide subsidised and flexible health services to patients.

7.7. LSR016

"If the management can help us/ to get more hands, more nurses to work on the ward, it will help a lot in I mean, I mean, the outcome of the treatment will be perfect."

8. Discussion of findings

Information and knowledge management is one of the initial themes that made up main theme 1, the Organisational element. First, the outcome of this research opines that high-quality information and effective information dissemination strategy constitute a success factor for health organisations to flourish and support patients diagnosed with T2DM as similarly supported by [15]. Current evidence shows that an effective support system is efficacious for preventing, screening, diagnosing and reducing complications of T2DM for the optimisation of patient's quality of life.

Information plays a crucial role in knowledge sharing. Ackoff [2] defined the link between information and knowledge using a Data-Information-Knowledge-Wisdom (DIKW) hierarchy. Integrating Ackoff's ideology to this research translates that data (information) is the product of knowledge. Effective information and knowledge management have resulted in various evidence-based patient care. For instance, Cnop et al. [20] clarified the role of fatty acid and glucolipotoxicity. Holman, Hillson, and Young [28] affirmed the safety of early insulin treatment for individuals who cannot maintain normal glucose control through diet and exercise. Chen, Magliano, and Zimmet [18] conducted worldwide epidemiological research to clarify the prevalence of T2DM in children. [29] proposed diet modification and exercise as workable approaches to glycaemic homeostasis.

The outcome of this research, information and knowledge management explains why Ofori and Unachukwu [39] supported the sharing of DM-related information with patients'

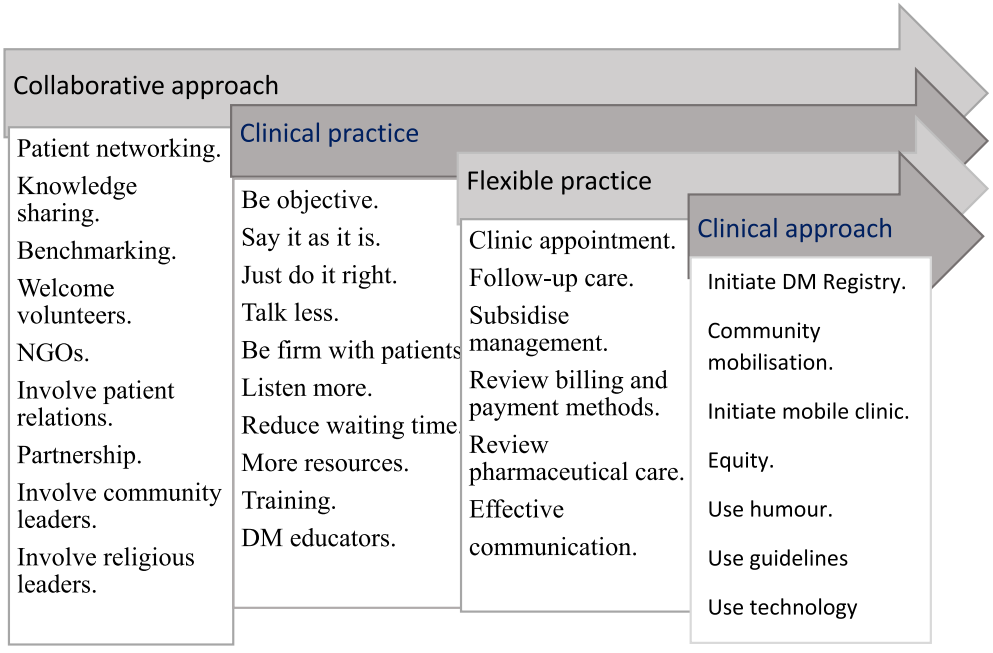

Fig. 3 – Strategies for successful outcomes.

families improved patients' health conditions and minimised risk of developing DM in other family members. Emmanuel and Otovwe [24] revealed how poor information management worsened patient health outcomes. Adeloye et al. Adeloye et al. [3] connected the increasing burden of T2DM in Nigeria to poor information dissemination. This is evident by lack of information in the literature about the estimated number of individuals diagnosed with T2DM in Nigeria and no clear and up to date information (in form of guidance) is either available or accessible online to guide health professionals.

Research by Bains and Egede [11] showed that DM literacy levels of patients and their perception about the effectiveness of the services they had were the most important factors associated with their glycaemic control. Evidence showed that patients lacked self-management. This happened due to the deficient DM education received from their health providers [31,41,5]. World Health Organization [50] recognises that knowledge management plays a central role in the effective management of long-term conditions. Shani et al. [44] pointed out that structured follow-up care for patients diagnosed with T2DM enabled patients to adhere to follow-up protocol. Unfortunately, a recent integrative review conducted by Alotaibi [7] claimed that internationally, nurses demonstrated significant and long-standing knowledge deficits in many aspects of DM care.

Therefore, the outcome of this research adds that shaming and blaming of health providers are unhelpful to patient management rather, through collaborative working, effective and fair knowledge sharing across all health professionals in clinical settings can optimise patient care.

Second, the outcome of this research also suggests that decision characteristics, decision-maker characteristics, policies, as well as regulation, should upgrade to evidence-based. This means that decisions taken, at macro and micro levels of care should be determined by many factors. The size of the hospital, location, structures, culture, strategic orientation as well as the absorptive capacity (resources and expertise) of health institution to deliver health services to patients.

In Nigeria, there are limitations in decision and policies for drug regulation [21,27]. Pharmaceutical companies spend a significant amount of resources influencing the prescribing behaviour of physicians [25]. Certainly, this practice can negatively affect rational prescribing, which in turn, sabotages the quality of health services and patients. These research participants expressed concern about poor government drug-regulations activities and no active research processes to control the type of medications and glucometers imported into the country.

Finally, relationship management emerged as a theme contributing to the Organisational Element. A relationship entails elements that are crucial to health providers and patients. Many patients can manage their T2DM well through lifestyle modification, while some patients may require pharmacologic interventions for their management. In both cases, patients can potentially be uncompliant or low compliant to clinical advice due to diverse limiting factors.

A systematic review by Davies et al. [23] identified various psychological issues and orientations such as the patient's external locus of control-delayed intellectual and emotional development; impulsive and avoidant coping styles, number of life events; depression; motivational issues; and eating disorders as contributory factors to nonadherence. The study also emphasised that family factors such as poor communication, low socioeconomic status, low financial resources, and family stress inhibit adherence with recommended DM management interventions. Jin et al. [33] conducted a review from the patient's perspective to understand factors affecting compliance to lifestyle modification and therapeutic management. The outcome of the review indicated good interaction and relationship between health professionals and patients heightened patient compliance and adherence to treatment.

Adults often have sub-optimal T2DM outcomes due to low compliance. [35] suggested they might need a more structured education and follow-up sessions that require sound health personnel-patient relationship to flourish. Jensen et al. [32] added that education based on the adjunct of lifestyle, therapeutic relationship and pharmacologic interventions yielded a better outcome for patients. Kassahun, Eshetie, & Gesesew, [34] defended that non-adherence in the African population was not always a deliberate act but due to factors such as side effects of medications, the complexity of regimen, memory issues and socio-demographic factors such as low educational level and poor monthly. However, a *meta*-analysis by Norris et al. [38] pointed out that contact time between educator and patient during patient education improved patients' adherence and compliance to management.

Sharma, et al. [45] suggested that a high rate of nonadherence to the treatment can be subdued through constant motivation by health professionals. This suggestion aligns with the earlier work of Ciechanowski and Katon [19] stressed that the relationship between patient and health provider strengthens patient's adherence to treatment. Xu et al. [51] found out that knowledge, social support, and provider-patient communication affected the patient's self-management indirectly. Lou et al. [37] divulged that a better provider-patient relationship improves DM self-management practice. Bagnasco et al. [10] disclosed that interpersonal relationships, motivation, and empowerment served to improve patients' self-management. Boonsatean et al. [12] unveiled how Buddhism served as a spiritual refuge for women to cope with their DM psychological burdens.

In Nigeria, Awodele and Osuolale [9] negated the association between educational level and patient adherence to T2DM treatment but instead highlighted health setting-related factors as education and counselling resulted in a high adherence rate. The quality of the therapeutic relationship that health providers have with patients can improve the patient's knowledge. Therefore, to achieve a successful patient outcome, participants suggest that health providers involved in patient education should focus on realistic health-promoting actions that will encourage patients' positive DM outcomes. This finding is similar to the work of Corser et al. [22] and Utz et al. [47]. Partnership and collaboration are key elements of a successful strategy [29]. Patients can collaborate to share their self-management experiences. Patients can obtain high-quality care and improved health outcomes if they interacted with prepared, proactive and motivated health providers [14].

In conclusion, health professionals, health sectors and the government should collaborate and make positive decisions

at national and international levels to foster effective T2DM management.

9. Limitations

The chosen research methodology addressed the research aims and objectives. However, there is one limitation. It was challenging to triangulate all the information provided by the nurses at managerial positions in Lagos public hospitals. To some extent, nurse managers mostly provided context-based information that might not be transferable and applicable to all public hospitals in Nigeria.

10. Implications

Since T2DM is a long-term condition, its management can be challenging for patients, their families and carers, as well as for government and clinical providers [49]. Despite the challenges, multiple professional expectations are demanded by health providers. Through the empowerment model, health providers can provide low-cost or no-cost clinical support for effective patients' management through three elements; effective information and knowledge management, decision and resources management and relationship management. According to the outcome of this research, these three elements constitute an effective organisational support system that can promote patients' DM literacy, lifestyle choices, and self-care management. It is possible that patient-related factors also influence T2DM management however, organisational infrastructures and health providers' operations can enable patients to obtain affordable, accessible and management [49].

This research acknowledges that clinical providers face a variety of challenges, but the focus of this inquiry is on organisational infrastructures and operational factors influencing T2DM management in clinical settings. A variety of initiatives from health care providers can provide a pathway for organisational policy redirection in favour of optimisation of patient care [6]). The outcome supports that organisational activities can optimise patient management and patient empowerment [29]. recommends that health providers, through the empowerment model, enable patients to experience optimal health quality and sustainable self-management ability.

11. Conclusions

Given the robust data that emerged from the participants of this research, findings from this research have illuminated fundamental organisational operations influencing T2DM management in public hospitals across Lagos. The research outcome has contributed to an understanding of some of the complexities and nuances regarding operational activities within the clinical settings that impact T2DM management across Nigeria.

This research has highlighted specific aspects of nursing practice that are of enormous relevance to the optimisation of T2DM management in public hospitals across Nigeria. Strategies for Improving Diabetes Care in Nigeria (SIDCAIN) is one of the initiatives by the Nigerian government that focuses on effective DM management through a multidisciplinary approach. The research outcome has provided grassroots information and nurses' perspectives for the formulation of policies that can address challenges associated with T2DM management across the nation.

12. Recommendations

The below three recommendations are directed to the organisational level such as the Hospital Board Management.

- Provision of conducive clinic set-up and initiate flexible coordination of the T2DM clinic.
- Preservation of professionalism and equity in clinical practice.
- Organise workshops for health professionals in a public hospital setting across Nigeria and publish research on the outcome in hospitals' newsletter for application to practice.

The last three recommendations below, if adopted at the national level, could inform broader care provided to patients at a low-or-no-cost, to strengthen patient empowerment and self-management.

- Initiate pragmatic strategies to promote collaboration and partnership in the Nigerian public health sector.
- Consider the conceptual model developed from the outcome of this research to inform effective T2DM management in Nigeria.
- Sponsor nationwide research that can provide generalisable insight into organisational factors influencing T2DM management across the nation.

Summary of what is already known about the topic

- T2DM is often preventable. However, its prevalence is increasing globally, most markedly in the world's middle-income countries [29].
- Globalisation plays a consequential role in contributing to a high incidence of T2DM across the world. Global marketing fuels an obesogenic environment by making tobacco, alcohol, and high-salt and high-sugar foods available in many countries across the world [1].
- While the effect of globalisation on healthy eating and lifestyle choices is detrimental, Nigerian foods itself is another contributing factor. Most Nigerian foods have high calories component which predisposes people to obesity [40].
- A significant number of factors impact on effective management of T2DM across countries [49].
- The [49] noted that many health settings lacked effective policies to facilitate effective management of individuals diagnosed with T2DM especially for those people with limited resources. Therefore, appealed for advancement in conducting grassroots and home-based research for the

formulation of policies that can pragmatically address challenges associated with T2DM management across every nation.

- Despite the appeal, in Nigeria, previous studies were one-directional as they unfairly blamed the individuals for their lifestyle choices. The studies ignored to explore organisational factors influencing effective patient management (Bosun-Arije et al., [54]).

Funding sources

None.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.diabres.2020.108288.

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